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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
OLSEN, KAJ K	

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1795	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/607,856	SHUK ET AL.	
	Examiner	Art Unit	
	Kaj K. Olsen	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 November 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6,8-12 and 23-29* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6, 8-12, 23-29* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *11-5-2007*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 23-29 are rejected under 35 U.S.C. 102(b) as being anticipated by JP 11-271,269 (hereafter "JP '269"). JP '269 is being cited and relied on for the first time with this office action.

3. With respect to claims 23 and 28, JP '269 discloses a solid state device comprising a solid electrolyte 1, a reference electrode 2 coupled to a surface of the solid electrolyte, a working electrode 5 including CeO_2, which the applicant evidences is a mixed ion/electron conductor and is a ceria-containing fluorite material, wherein the working electrode is coupled to the same surface of the solid electrolyte as the reference electrode. See fig. 1 and p. 11 of the translation. See p. 15 and claim 28 of the instant invention specification where they state ceria materials are mixed-conducting fluorite materials. With respect to the device being for the determination of a concentration of oxygen in a gas phase, that is only the intended use of the apparatus and the intended use need not be given further due consideration in determining patentability. Furthermore, with respect to the gas atmosphere that the reference electrode is exposed to, that also constitutes the intended use of the device.

4. With respect to claim 24, JP '269 uses yttria doped zirconia. See p. 11 of translation.

5. With respect to claim 25, JP '269 uses Pt for electrode 2. See p. 11 of the translation.

6. With respect to claims 26 and 27, these claims only further limit claim 25 when metal oxide is chosen from the Markush group of claim 25. Because claims 26 and 27 do not actually require metal oxide be chosen from the groupings of claim 25, claims 26 and 27 do not further limit claim 25 when Pt is chosen.

7. With respect to claim 29, this claim only further limits claim 28 when a solid solution doped with at least one mixed valency element is chosen from the Markush group of claim 28. Because claim 29 does not actually require a mixed valency solid solution be chosen from the groupings of claim 28, claim 29 does not further limit claim 28 when ceria is chosen.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Claims 1, 3-6, 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sheridan et al (USP 5,627,328) in view of Dalla Betta et al (USP 5,314,828).

11. In the previous office action of 8-27-2007, the previous examiner set forth why the teachings of Sheridan and Dalla Betta rendered obvious the claimed invention. Upon amendment, claim 1 now states that each of the first and second RTD's are thermally coupled to its respective cover by a thermoconductive material. This examiner believes that condition has already been rendered obvious by the cited prior art. In particular, Dalla Betta teaches that the temperature sensing device 114 can be cemented to the substrate using a known ceramic cement. See col. 6, ll. 5-11. With respect to this cement being a "thermoconductive material", the broadest reasonable interpretation of the term "thermoconductive material" is any material that is thermally conductive. Because any material has some level of thermal conductivity, it would meet the definition of a thermal conductive material. Because applicant has not defined any thresholds for what would reasonably be construed as being suitably thermally conductive, this limitation of "thermoconductive material" is inherently met by the unspecified cement of Dalla Betta because any material, even a highly insulating material, is thermally conductive. Similarly with the limitation "thermally coupled", any solid bonding between the RTD and substrate (i.e. cover) of Dalla Betta would result in a thermal coupling even if that thermally coupling were very small (i.e. made with insulating materials).

12. With respect to the use of ceramic cement for joining the first and second covers to the holder, Dalla Betta already discloses the use of ceramic cements for attaching the RTD to the cover (col. 6, ll. 5-11) and a ceramic cement would thereby be an obvious choice for the unspecified attachment of elements 110 and 112 to holder 626.

13. Claims 1-6 and 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sheridan in view of Dalla Betta and McQueen (USP 4,994,780) (hereafter "McQueen '780"). McQueen '780 is different from the previous McQueen '385 teaching and is being cited and relied on for the first time with this office action. This examiner believes McQueen '780 better renders obvious the claimed invention especially the new limitations of claim 1 for reasons cited below.

14. Claims 1-6 and 10-12 were utilized above and in the previous office action against the claims because the substrates 110 and 122 read on the broadest reasonable interpretation of first and second protective covers. However, even if elements 110 and 122 were not deemed to read on the defined first and second protective covers, it is noted that Dalla Betta appears to be relying on conventional RTD's known in the art. See col. 15, ll. 6-8. McQueen '780 teaches that RTD's can take a number of forms in the art, including as bare resistive wires exposed to the monitored environment (fig. 1 and 3) or can be encased in a protective tubing 41 made of metal so as to protect the RTD from corrosive environments. See fig. 5 and col. 5, l. 57 through col. 6, l. 47. McQueen further states that the spaces between the resistive filament and the metal tube can be filled with a thermoconductive potting material to provide uniform heat transfer. See col. 6, ll. 28-34. Because both Sheridan and Dalla Betta are drawn to the monitoring of noxious and potential corrosive gas environments (see Sheridan, col. 1, ll. 14-24 and Dalla Betta, col. 1, ll. 14-19) and because Dalla Betta is to be coated with potentially corrosive catalytic compounds (col. 15, ll. 17-20), it would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize a RTD having a protective cover, like those taught by

McQueen '780, so as to prevent these corrosive environments from coming into contact and damaging the actual RTD filaments.

15. With respect to the use of stainless steel for the tubing, stainless steel would have been an obvious choice of material for the metal tube as it is an inexpensive common alloy that is useable in corrosive environments (see Dalla Betta, col. 15, ll. 4-6 for example).

16. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sheridan in view of Dalla Betta, or Sheridan in view of Dalla Betta and McQueen '780, as applied to claim 1 above, and further in view of Lauder (USP 3,897,367).

17. Regarding claim 8, Sheridan in view of Dalla Betta or Dalla Betta and McQueen '780 does not explicitly disclose the catalyst comprises perovskite. Lauder teaches a catalyst comprising perovskite (column 1, lines 5 - 8 and column 5, lines 61 - 63). It would have been obvious to one of ordinary skill in the art to have modified the device of Dalla Betta or Dalla Betta and McQueen in the system of Sheridan to substitute perovskite as the catalyst as taught by Lauder because as Lauder explains perovskite provides the benefit of stability and durability at high temperatures and has been shown to catalyze the oxidation of hydrocarbons and carbon monoxide (column 7, lines 4-17).

18. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sheridan in view of Dalla Betta, or Sheridan in view of Dalla Betta and McQueen '780, as applied to claim 1 above, and further in view of Valentine et al. (USP 2,916,358).

19. Regarding claim 9, Sheridan in view of Dalla Betta or Dalla Betta and McQueen '780 does not explicitly disclose the catalyst comprises hopcalite. Valentine teaches a catalyst comprising hopcalite (column 2, lines 23-28). It would have been obvious to one of ordinary

skill in the art to have modified the device of Dalla Betta or Dalla Betta and McQueen '780 in the system of Sheridan to substitute hopcalite as the catalyst as taught by Valentine because it causes the combustion of carbon monoxide and allows for its detection in a reliable and speedy manner (column 1, lines 15-30) as explained by Valentine.

20. Claims 23-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Makino et al (USP 5,676,811 in view of GB 2 104 666 (hereafter "GB '666") and/or Isenberg (USP 4,702,971). Both Makino and GB '666 are being cited and relied on for the first time with this office action. Isenberg was previously cited but is being relied on here for the first time.

21. With respect to claim 23, Makino discloses a solid state device for determining the concentration of oxygen in a gas phase (see abstract) comprising a solid electrolyte 35, a reference electrode 13 coupled to a surface of the solid electrolyte and being exposed to a gas with a known partial pressure of oxygen 19 (col. 5, ll. 1-11), and a working electrode 12 wherein the working electrode is coupled to the same surface of the solid electrolyte as the reference electrode. See fig. 1 and 2; col. 4, ll. 49-55 and col. 7, ll. 46-33. Makino does not explicitly disclose the use of a ceria-containing fluorite group of materials for the working electrode. GB '666 discloses in an alternate oxygen sensor a working electrode constructed out of mixed ion/electron conductor such as a mixture of PrO_{2-x} or TbO_{2-x} and CeO_{2-x} and teaches that such an electrode is less susceptible to poisoning and provides rapid response even in SO_x containing gases. See p. 1, ll. 18-57. Isenberg provides an explanation as to why the electrode of GB '666 would have had better response in SO_x gases and provide further motivation for the use of ceria oxides for the working electrode surfaces, namely that a similar combination of Tb and Ce oxides provides tolerance from SO_x poisoning. See col. 2, ll. 3-18 and col. 4, ll. 55-68. It would

have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the teaching of either GB '666 and/or Isenberg for the working electrode of Makino so as to make the working electrode of Makino less susceptible to Pb or SOx poisoning and to provide a better sensor response in gas containing H_2, CO, SO_x, and hydrocarbons. It is noted that Makino already recognized the problem of sulfur poisoning in gas sensors (col. 6, ll. 53-59) providing further motivation for one possessing ordinary skill in the art to look to teachings such as GB '666 and Isenberg to improve the sensor performance in the presence of sulfur compounds.

22. With respect to claims 24 and 25, see Makino, col. 17, l. 62 through col. 18, l. 5.

23. With respect to claims 26 and 27, these claims only further limit claim 25 when metal oxide is chosen from the Markush group of claim 25. Because claims 26 and 27 do not actually require metal oxide be chosen from the groupings of claim 25, claims 26 and 27 do not further limit claim 25 when Pt is chosen.

24. With respect to claim 29, this claim only further limits claim 28 when a solid solution doped with at least one mixed valency element is chosen from the Markush group of claim 28. Because claim 29 does not actually require a mixed valency solid solution be chosen from the groupings of claim 28, claim 29 does not further limit claim 28 when ceria is chosen. However, see p. 1, ll. 54-57 of GB '666 and col. 4, ll. 55-68 of Isenberg.

Response to Arguments

25. With respect to the arguments about the new limitation of claim 1 and the rejection of Sheridan in view of Dalla Betta, these are unpersuasive for the reasons set forth in the body of

the rejection above. The remaining arguments are moot in view of the numerous new rejections being introduced here.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kaj Olsen whose telephone number is (571) 272-1344. The examiner can normally be reached on Monday through Friday from 8:00 A.M. to 4:30 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen, can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AU 1795
January 12, 2008

KAJ K. OLSEN
PRIMARY EXAMINER